

REMARKS

In the instant amendment, claim 13 is cancelled, and the subject matter thereof is added to claim 12. Claim 12 is amended to more particularly recite the subject matter of the present invention. No new matter is added by the instant amendment as the subject matter of claim 12 may be found in the specification and in original claim 13.

Claims 12, 14-24 and 26 are submitted to the Examiner for further consideration on the merits.

A. Introduction

In the Office Action mailed December 6, 2001, the Examiner rejected claims 12, 14-16, 18-22, 24 and 26 under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,166,423 to Gambino et al. ("the Gambino et al. reference") in view of United States Patent No. Re. 36,786 to Fazan et al. ("the Fazan et al. reference"). The Examiner rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over the Gambino et al. reference and the Fazan et al. reference as applied to claim 12, and further in view of United States Patent No. 5,498,889 to Hayden ("the Hayden reference"). The Examiner rejected claim 17 under 35 U.S.C. § 103(a) as being unpatentable over the Gambino et al. reference and the Fazan et al. reference as applied to claims 12 and 14, and further in view of United States Patent No. 6,074,907 to Oh et al. ("the Oh et al. reference"). The Examiner rejected claim 23 under 35 U.S.C. § 103(a) as being unpatentable over the Gambino et al. reference and the Fazan et al. reference as applied to claim 12, and further in view of United States Patent No. 6,066,555 to Nulty et al. ("the Nulty et al. reference").

B. Rejection of Claims 12, 14-16, 18-22, 24 and 26 under 35 U.S.C. § 103(a)

In the outstanding Office Action, the Examiner rejected claims 12, 14-16, 18-22, 24 and 26 under 35 U.S.C. § 103(a) as being unpatentable over the Gambino et al. reference in view of the Fazan et al. reference, stating:

With regard to claim 12, Gambino discloses in figure 11 providing an insulating substrate (305). Gambino discloses in figure 11 simultaneously forming a first wire line (315) and a lower electrode (310) on predetermined surfaces of the insulating surfaces. Gambino discloses in figure 11 forming an interlevel insulating layer (307) on the substrate, on the first wire line, and on the lower electrode. Gambino discloses in figure 12 selectively etching the interlevel insulating layer to expose a predetermined surface of the lower electrode and a predetermined surface of the first wire line thereby simultaneously forming in the interlevel insulating layer: (i) a first via hole (320) having sidewalls and disposed above the lower electrode; and (ii) a second via hole (330) disposed above the first wire line. Gambino discloses in figure 13 forming a conductive layer (328) on the interlevel insulating layer and in the first and second via holes. Gambino discloses in figure 14 etching back the conductive layer. Gambino does not disclose etching back the conductive layer to form a spacer on the sidewalls of the first via hole. Fazan teaches in column 4, lines 66 and 67, column 5, lines 1 – 14 and figures 1 and 2 etching back a conductive layer to form: (i) a conductive sidewall spacer (22) on a conductive layer formed in a first via hole (21) and on sidewalls of the first via hole for preventing dielectric disconnection. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the etching back of a conductive layer of Fazan to form the conductive spacers in the first via hole of Gambino in order to maximize the area of a capacitor electrode. Gambino further teaches etching back to form: (ii) a conductive plug in the second via hole; and (iii) an exposed surface containing the conductive plug, the predetermined surface of the lower electrode, and predetermined surfaces of the interlevel insulating layer. Gambino discloses in figure 15 forming a dielectric layer on the exposed surface and it is further obvious that the dielectric layer would be formed on the conductive sidewall spacer and the conductive layer formed in the first via hole. Gambino discloses in figure 16 removing (332 and 334) the

dielectric layer on the exposed surface except for a predetermined portion of the dielectric layer disposed on a predetermined surface of the lower electrode and it is further obvious that the dielectric layer would remain disposed on the conductive sidewall spacer. Gambino discloses in figures 17 - 18 simultaneously forming: (i) a second wire line (324) connected to the conductive plug; and (ii) an upper electrode (324) connected to the dielectric layer.

Office Action of December 6, 2001, at pp. 2-3.

Regarding the Fazan et al. reference, the conductive layer and the conductive sidewall spacers are "a thin poly layer" and "poly spacers" respectively, as may be seen in the Fazan et al. reference at col. 5, lines 10-11. In contrast, the conductive layer and conductive spacers of the present invention as claimed in claim 12 are made of a tungsten containing material. Furthermore, the conductive layer of the Fazan et al. reference is not etched using a tungsten etch back procedure to form all of: a tungsten containing conductive sidewall spacer on the tungsten containing conductive layer formed in the first via hole and on the sidewalls of the first via hole for preventing dielectric disconnection and a tungsten containing conductive plug in the second via hole, and an exposed surface containing the spacer, conductive plug, the predetermined surface of the lower electrode, and predetermined surfaces of the interlevel insulating layer, as claimed in claim 12 of the present invention, as there is no second via hole in the Fazan et al. reference.

Further still, the tungsten containing conductive sidewall spacer of the present invention as claimed in claim 12 is formed as a by-product of using tungsten to remove part of the tungsten containing layer, thereby allowing the formation of the tungsten containing sidewall spacers, as well as the tungsten containing plug, without performing any additional spacer forming processes.

Based on the reasons stated above, the differences between the method claims of the present invention and the method disclosed and taught by the Fazan et al. reference, as well as the difference between the method claims of the present invention and the method and device disclosed and taught by the Gambino reference, are believed to be patentably distinguished. Accordingly, reconsideration and withdrawal of the rejection of claim 12 of the present invention are respectfully requested.

Also, because claims 14-16, 18-22, 24 and 26 depend from claim 12, either directly or indirectly, it is believed that claims 14-16, 18-22, 24 and 26 are allowable as depending from an allowable base claim. Therefore, reconsideration and withdrawal of the rejections of claims 14-16, 18-22, 24 and 26 are respectfully requested.

C. Rejection of Claim 13 under 35 U.S.C. § 103(a)

Claim 13 has been cancelled, therefore rendering this rejection moot.

D. Rejection of Claim 17 under 35 U.S.C. § 103(a)

Claim 17 depends from claim 12, which is now believed to be allowable, and therefore claim 17 is believed to be allowable as depending from an allowable base claim. Accordingly, reconsideration and withdrawal of the rejection of claim 17 are respectfully requested.

E. Rejection of Claim 23 under 35 U.S.C. § 103(a)

Claim 23 depends from claim 12, which is now believed to be allowable, and therefore claim 23 is believed to be allowable as depending from an allowable base claim. Accordingly, reconsideration and withdrawal of the rejection of claim 23 are respectfully requested.

E. Conclusion

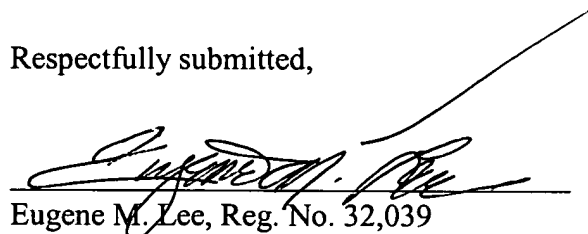
Since none of the prior art cited, whether alone or in combination, either anticipates or renders obvious claims 12, 14-24 and 26, it is submitted that these claims are in condition for allowance, and a notice to that effect is respectfully requested.

Finally, if the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is respectfully requested, and an early and favorable notice of allowance is earnestly solicited.

Respectfully submitted,

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